

A COMPARATIVE STUDY ON REFRACTORY PROPERTIES OF DOLOMITE USING CLAY AS ADDITIVES

Oyetunji Oluremilekun Ropo¹, Pele Babatope Olabanji² & Orisawayi Abimbola Oluwatayo³

^{1,2}Research Scholar, Department of Mechanical Engineering,
Ladoke Akintola University of Technology, Ogbomoso, Nigeria

³Research Scholar, Department of Mechanical Engineering,
Ondo State University of Science and Technology, Okitipupa, Nigeria

ABSTRACT

The progress in the metallurgical field in Nigeria has called for an increase in demand for refractory materials in recent times. A large proportion of these materials are currently being imported to meet its increasing demand. Therefore, this stirs up the need to investigate the properties of suitable locally made refractory.

This study presents the results of comparative analysis and evaluation of the refractory properties of some prepared dolomite purchased at Ilorin using clay deposit in OrileIgbon, Ogbomosh, Nigeria as an additive with a view of improving the suitability of dolomite uses as a refractory material.

The test carried out, revealed that the dolomite and water has a bulk density between 1.27 – 2.05g/cm³, linear shrinkage between 0 - 0.73%, 12-17 cycles for thermal resistance and a value between 0.21 and 0.34KN/cm² for cold crushing strength, dolomite, water and honey has a bulk density between 1.61 – 3.03g/cm³, linear shrinkage between 0 - 0.74%, 12-35 cycles for thermal resistance and a value between 1.11 - 2.51KN/cm² for cold crushing strength. Dolomite, clay, water, and honey has a bulk density between 1.72 – 2.56g/cm³, linear shrinkage between 0 - 0.76%, 19-42 cycles for thermal resistance and a value between 1.41 and 2.57KN/cm² for cold crushing strength and clay and water has a bulk density between 1.93 – 2.44g/cm³, linear shrinkage between 0 - 8.70%, 22-42 cycles for thermal resistance and a value between 2.90-3.95KN/cm² for cold crushing strength which shows that the investigated properties, the mixture (clay and dolomite) and clay alone are better refractory materials and suitable for lining of furnace where the materials melted requires basic environmental and operating temperature above 1100°C than dolomite alone.

KEYWORDS: Clay, Dolomite, Refractory Materials

Article History

Received: 12 Jul 2017 | Revised: 29 Sep 2018 | Accepted: 12 Oct 2018
